WHAT IS CLAIMED IS:

- An intermittent aberrant component activity tracking method comprising:
 continuously monitoring a component;
 sensing a characteristic of the component;
 performing real time statistical calculations using sensed values of the characteristic of the component; and
 storing, in a memory, data including results of the calculations indicative of a fault.
- 2. The method of claim 1 further comprising providing for retrieval of the data.
- 3. The method of claim 1 further comprising uploading the data to a main controller at regular intervals.
 - 4. The method of claim 1 wherein the component is an encoder.
- 5. The method of claim 4 wherein the sensed characteristic of the encoder is its timing.
- 6. The method of claim 4 wherein servo specifications of the encoder require a tolerance of $\pm 0.1\%$ to $\pm 5\%$.
 - 7. The method of claim 1 wherein the component is a sensor.
- 8. The method of claim 1 further comprising using a serial control bus to retrieve the data in real time.
 - 9. The method of claim 1 wherein each data point is put into a range bucket.

- 10. The method of claim 9 further including incrementing an event count at a respective location when a data point falls into a range bucket.
- 11. The method of claim 9 wherein the data are represented by a counter rather than a real encoder value.
- 12. The method of claim 1 wherein the main controller analyzes the data as necessary.
- 13. The method of claim 1 wherein only data values outside of normal run limits would be recorded and studied
- 14. An aberrant machine component events history providing method comprising:

communicating data about machine operation to service personnel; and alerting service personnel, when a threshold of events is reached, that a failure is imminent.

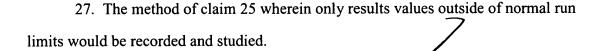
- 15. The method of claim 14 further comprising allowing access to the data to determine if further repairs are needed.
 - 16. The method of claim 15 wherein the data can be accessed remotely.
 - 17. The method of claim 14 wherein the component is a motor encoder.
 - 18. The method of claim 14 wherein the component is a sensor.
- 19. The method of claim 14 wherein the component is a power supply and the data reflect voltage readings.

- 20. The method of claim 14 wherein the component is responsible for timing functions.
- 21. The method of claim 14 wherein the component produces and the system records pulse width modulation (PWM) values.
 - 22. A fault detection apparatus comprising:

 means for continuously monitoring a component characteristic;

 means for performing real time statistical calculations; and

 means for storing, in a memory, results of the calculations indicative of a fault.
- 23. The apparatus of claim 22 further comprising means for allowing retrieval of the results by service personnel.
- 24. The apparatus of claim 22 further comprising means for uploading the results to a main controller at regular intervals during a run process.
- 25. A real time encoder frequency excursion recording method that can record excursions in real time on a PWBA in an operating environment, the method comprising: continuously monitoring the encoder timing; doing real time statistical calculations; and storing the results of the calculations indicative of a fault in a memory for retrieval by service personnel or for uploading to the main controller at regular intervals during the run process.
- 26. The method of claim 25 wherein servo specifications require a tolerance of $\pm 0.1\%$ to $\pm 5\%$.



- 28. The method of claim 25 further comprising using a serial control bus to retrieve the data in real time.
 - 29. The method of claim 25 wherein each data point is put into a range bucket.
- 30. The method of claim 29 further including incrementing an event count at a respective location when a data point falls into a range bucket.
- 31. The method of claim 29 wherein the data are represented by a counter rather than a real encoder value.
- 32. The method of claim 25 wherein the main controller analyzes the data as necessary.